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Water Supply Outlook For Arizona



SOIL CONSERVATION SERVICE
U.S. DEPARTMENT OF AGRICULTURE

Cooperating with

SALT RIVER VALLEY WATER USERS ASSOCIATION
and ARIZONA WATER COMMISSION

AS OF
APR. 1, 1981

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbia Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

COVER PHOTO: SNOW SURVEYORS MAKING SPECIAL MEASUREMENTS NEAR MT. ST. HELENS VOLCANO IN WASHINGTON, APRIL 1980.

PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, West Technical Service Center, Room 510, 511 N.W. Broadway, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	Room 129, 2221 East Northern Lights Blvd., Anchorage, Alaska 99504
Arizona	Room 3008, Federal Building, 230 N. First Ave., Phoenix, Arizona 85025
Colorado (N. Mex.)	P. O. Box 17107, Denver, Colorado 80217
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P. O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno, Nevada 89505
Oregon	1220 S. W. Third Ave., Portland, Oregon 97204
Utah	4420 Federal Bldg., 125 South State St., Salt Lake City, Utah 84138
Washington	360 U. S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82602

PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Snow Surveys Branch, California Department of Water Resources, P.O. Box 388, Sacramento, California 95802 --- for British Columbia by the Ministry of the Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia V8V 1X5 --- for Yukon Territory by the Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory Y1A 3V1 --- and for Alberta, Saskatchewan, and N.W.T. by the Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta T3C 1A6.



WATER SUPPLY OUTLOOK

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WATER SUPPLY OUTLOOK FOR ARIZONA

**and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS**

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Much of Arizona's surface water supply will come from this snowpack.

ARIZONA SUMMARY

As of
April 1, 1981

BELOW AVERAGE STREAMFLOW IS FORECAST FOR MAJOR ARIZONA STREAMS FOR THE APRIL-MAY PERIOD. STORAGE IN MAJOR RESERVOIRS IS STILL SUFFICIENT TO PROVIDE ADEQUATE WATER TO USERS HAVING ACCESS TO IT.

WATER SUPPLY

Streamflow forecasts are for below average discharge for the April-May period. The Salt River is forecast to produce 51% of average flow; Verde River, 34%; Tonto Creek, 39%; San Francisco River, 26%; Gila River, 25%; and Little Colorado River, 25%. Major reservoirs hold above average storage. Water users having access to these reservoirs should have adequate water supplies. Water users relying on direct stream diversion or small impoundments should plan on reduced water supplies.

SNOW COVER

The snow pack is below average even with the contributions of the storms during March. The snow pack is 67% of average on the Salt River Watershed, 52% of average on the Verde Watershed, 63% on the Gila drainage, and 83% on the upper Little Colorado River.

PRECIPITATION

March precipitation was much above average. Precipitation was about 165% of average on the Verde Watershed, 200% of average on the Salt River Watershed, 240% on the Upper Little Colorado River, and 235% on the Gila drainage. However, seasonal precipitation is still generally below average on these watersheds.

STREAMFLOW

Measured streamflow was much below average during March. Salt River Project reports an inflow to its system of 76,600 acre-feet, about 49% of average. Flow on the Gila River was about 25% of average for the month, and on the San Francisco River, 30% of average.

RESERVOIR STORAGE

Salt River Project reservoirs report a combined storage of 1,486,800 acre-feet, or 72% of capacity. San Carlos reservoir contains 610,900 acre-feet, 57% full. Lake Pleasant holds 103,600 acre-feet at 66% capacity. Lyman Reservoir on the Little Colorado River is 77% full with 23,600 acre-feet. A combined storage of 47,089,000 acre-feet, or 88% of capacity, is held in four major reservoirs on the Colorado River.

THIS IS THE LAST REPORT OF THE SEASON.

ABOUT APRIL
STREAMFLOW FORECASTS **1, 1981**

BASIN, STREAM and/or FORECAST POINT	THIS YEAR		PAST RECORD	
	FORECAST		FORECAST PERIOD	THOUSAND ACRE FEET
	Thousand Acre Feet	Percent of Average		Last Year
SALT RIVER DRAINAGE				
Salt near Roosevelt	86	51	Apr-May	392.3
"	58	56	April	228.7
Tonto Creek near Roosevelt	5.0	39	Apr-May	27.5
"	4.0	39	April	19.5
Verde River above Horseshoe	28	34	Apr-May	113.6
"	19	29	April	92.6
Total Salt River Project Streams	119	45	Apr-May	533.4
"	81	45	April	340.8
GILA RIVER DRAINAGE				
Gila River at Calva	7.8	23	Apr-May	38.3
Gila River near Gila	5.9	2.6	Apr-May	21.2
Gila River near Solomon	13.0	25	Apr-May	67.1
"	8.1	25	April	39.9
Gila River near Virden	6.1	24	Apr-May	25.4
Frisco River at Clifton	8.0	28	Apr-May	44.5
Frisco River at Glenwood	3.5	24	Apr-May	---
LITTLE COLORADO RIVER DRAINAGE				
Little Colo. River above Lyman Dam	2.2	25	Apr-June	---
Greer	3.4	54	Apr-June	---
GRANITE CREEK DRAINAGE				
Granite Creek	1.0	---	Apr-May	---
Willow Creek	0.7	---	Apr-May	---
MIMBRES RIVER DRAINAGE				
Mimbres River near Mimbres	0.3	---	Apr-May	---
COLORADO RIVER DRAINAGE				
Virgin River near Littlefield	35	74	Apr-June	152.0
Lake Mary Inflow	0.1	5	Apr-May	---
+ Based on 15-year period, 1963-77				
* Average for less than 15 years				

1981

SPRING RUNOFF
1000's of Acre-Feet

Stream and Station	Measured 1/ Runoff Jan- March	Forecast Runoff April-May	Total - 1981	January thru May % of Average	Last Year
Salt River at Intake	74.8	86	160.8	47	1112.6
Verde River above Horseshoe	63.1	28	91.1	41	1063.6
Tonto Creek above Roosevelt	11.9	5.0	16.9	31	382.9
Total Salt River Proj.	149.8	119	268.8	42	2559.1
Gila River near Virden	11.7	6.1	17.8	23	106.3
Gila River near Solomon	29.8	13.0	42.8	27	377.2
Gila River near Calva	15.1	7.8	22.9	19	309.9
San Francisco River at Clifton	15.5	8.0	23.5	31	178.6
Little Colorado at Lyman Reservoir (Jan-June)	---	2.2	---	--	---

1/ Provisional runoff provided by USGS and Salt River Project

WATER SUPPLY INVENTORY SALT RIVER VALLEY SYSTEM

IN ACRE-FEET

APRIL 1, 1981

AVERAGE WATER SUPPLY
ON APRIL 1

3,000,000

ANTICIPATED WATER SUPPLY
ON APRIL 1

2,500,000

2,000,000

1,500,000

1,000,000

500,000

0

Average
April-May
Runoff

Average
Summer
Runoff

Average
Reservoir
Storage

April-May
Forecast Runoff
Average Summer
Runoff

April 1
Reservoir
Storage

Based on Present Storage + Forecast Spring Runoff + Average Summer Runoff

RESERVOIR STORAGE (Thousand Acre Feet) APRIL 1, 1981

BASIN or STREAM	RESERVOIR	Usable Capacity	Usable Storage		
			This Year	Last Year	Average†
<u>GILA RIVER DRAINAGE</u>					
Agua Fria	Lake Pleasant	157.6	103.6	157.2	78.6
Granite	Watson Lake	4.7	2.4	4.6	3.3
Granite	Willow Creek	6.1	0.92	6.1	2.9
Gila	Painted Rock Dam	2,492	0	1,673	---
Gila	San Carlos	1,073	610.9	1,033	261.0
Salt (4)	Roosevelt, Apache, Canyon & Saguaro	1,755	1,388	1,643	1,251
Verde (2)	Bartlett and Horseshoe	309.6	98.5	276.7	148.8
Salt and Verde	6 Salt River Project Reservoirs	2,065	1,487	1,920	1,399
<u>COLORADO RIVER DRAINAGE</u>					
Colorado	Lake Havasu	619.4	569.6	543.6	557.4
Colorado	Lake Mohave	1,810	1,705	1,664	1,667
Colorado	Lake Mead	26,159	23,229	23,335	17,302
Colorado	Lake Powell	25,002	21,586	21,264	10,069
Little Colorado	Lyman	30.6	23.6	26.5	16.9
Little Colorado	Show Low Lake	5.1	1.0	5.2	2.3

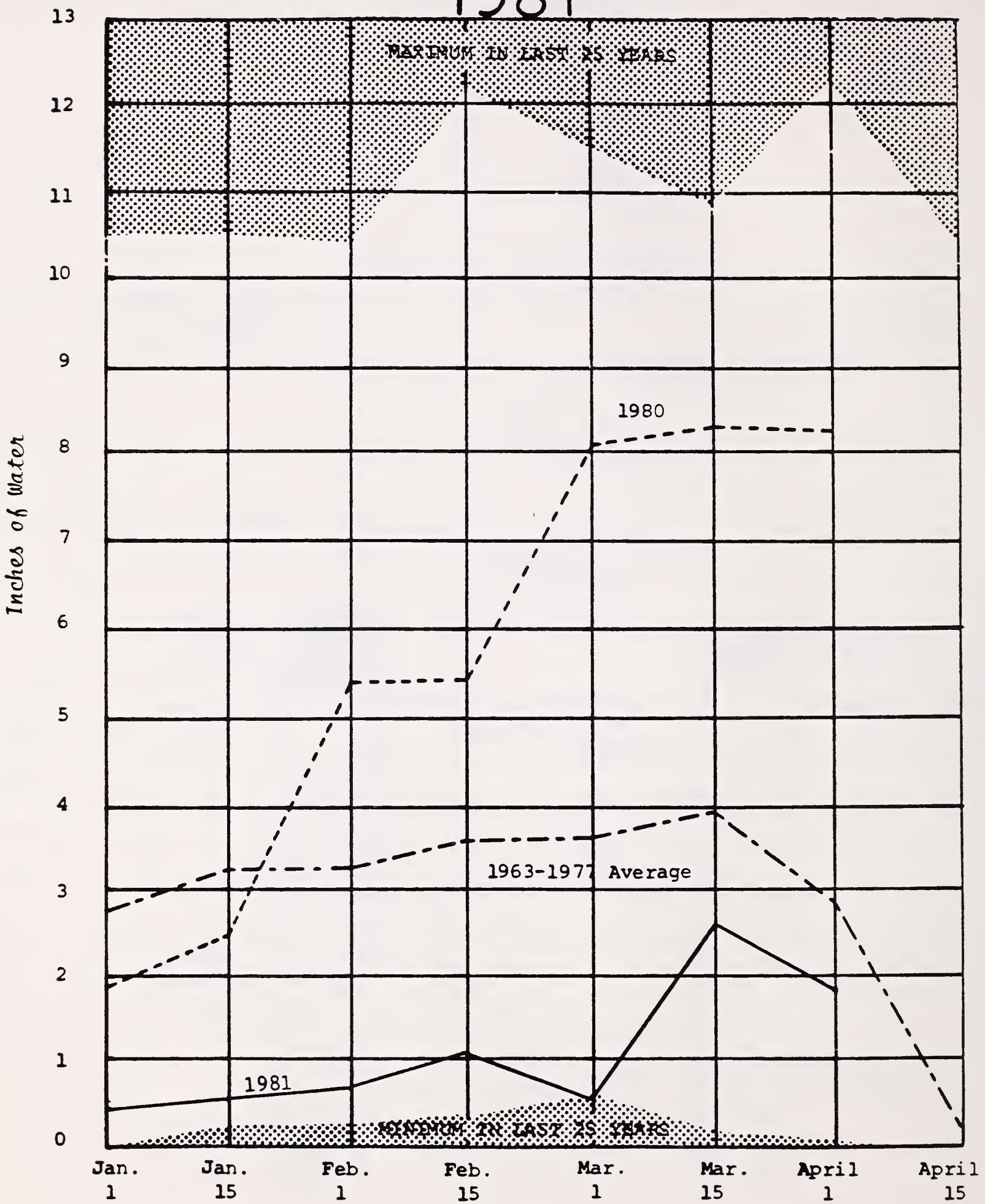
† Based on 15-year average, 1963-77

* Average is for less than 15 years of record.

AVERAGE SNOW COVER

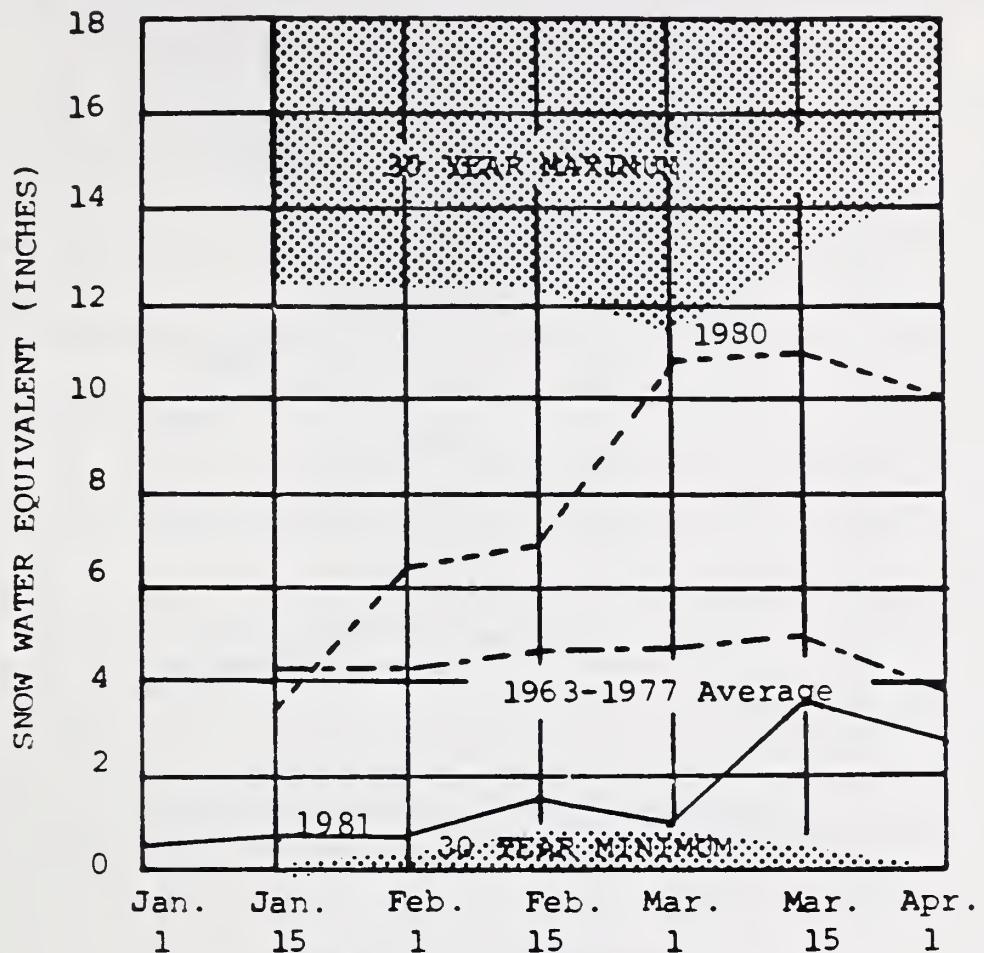
ARIZONA

1981

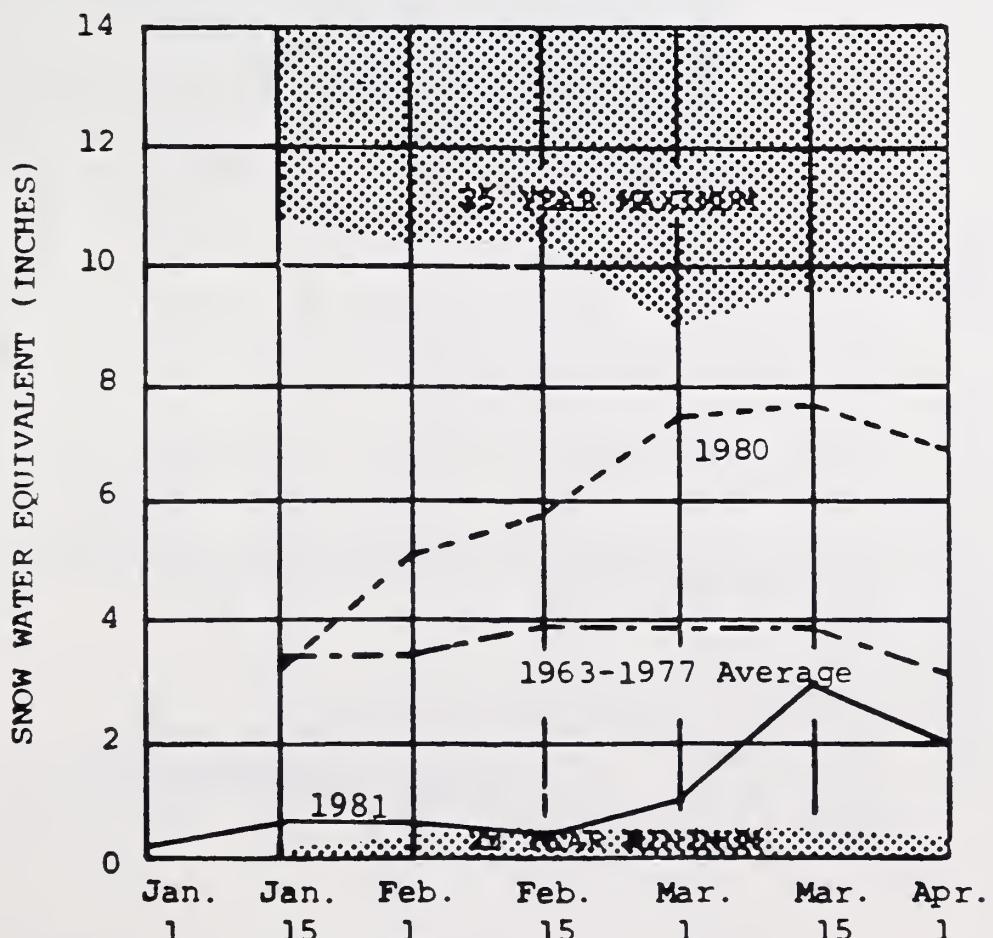


This graph represents the average snow water content on eleven selected snow courses on Arizona Sub-Watersheds.

1981 WATERSHED SNOW COVER



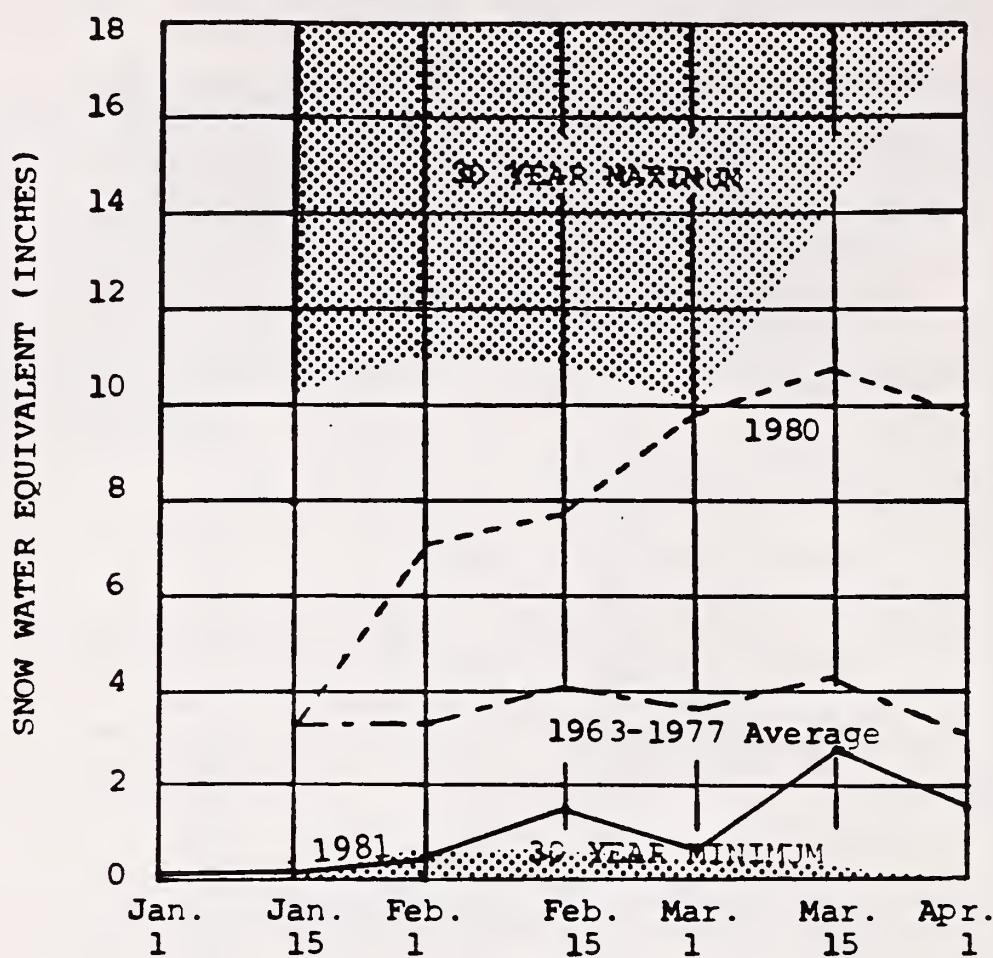
SALT RIVER



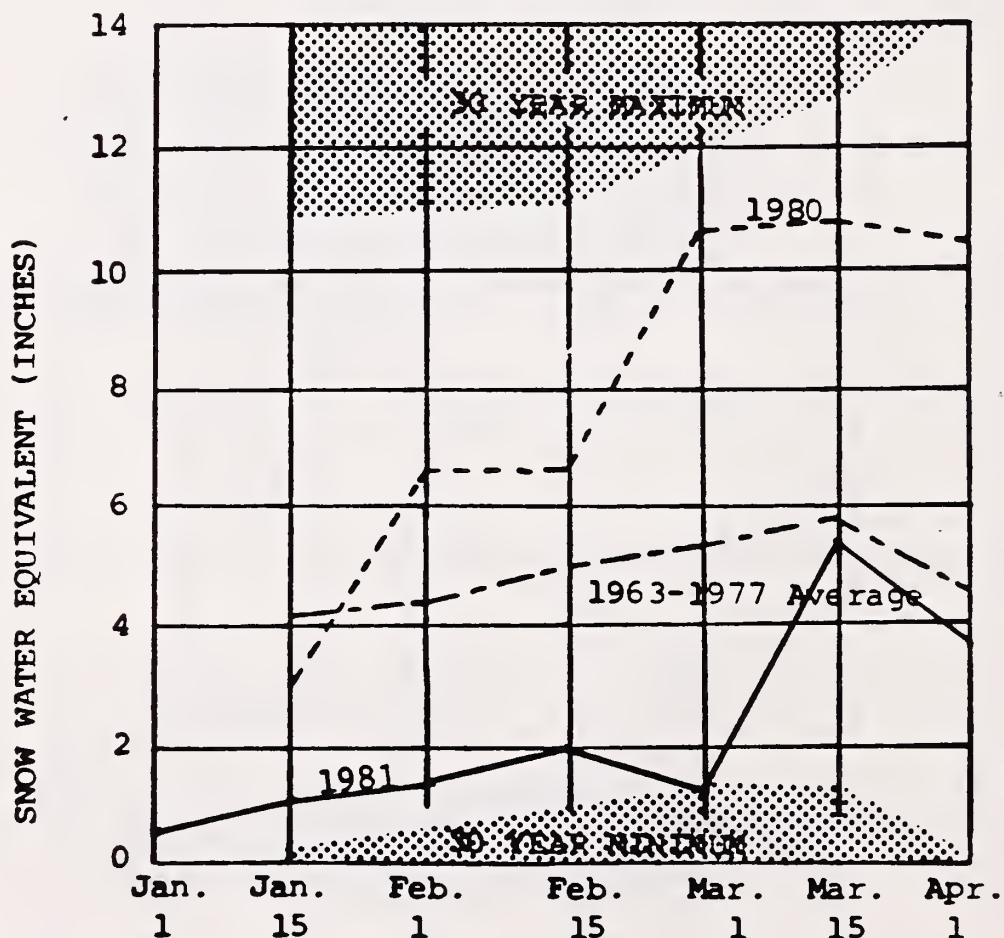
GILA RIVER

BASED ON SELECTED SNOW SURVEY COURSES

1981 WATERSHED SNOW COVER



VERDE RIVER



LITTLE COLORADO RIVER

BASED ON SELECTED SNOW SURVEY COURSES

SUMMARY of SNOW MEASUREMENTS (COMPARISON WITH PREVIOUS YEARS) ABOUT APRIL 1, 1981

RIVER BASIN and/or SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF	
		Last Year	Average
Gila	10	31	63
Salt	10	26	67
Verde	10	17	52
Little Colorado	5	36	83

SNOW ABOUT APRIL 1, 1981

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	Last Year
<u>SALT RIVER</u>						
Baldy *	9220	3/30	18	5.5	14.8	6.0
BALDY SNOTEL	9220	3/31	--	7.5	12.8	---
Beaver Head	8000	3/30	1	0.4	3.5	1.6
BONITO ROCK SNOTEL	8270	--	--	--	---	---
Canyon Creek	7500	3/30	0	0.0	9.6	2.2
Canyon Point	7600	3/30	0	0.0	11.7	2.3**
Coronado Trail	8400	3/30	0	0.0	6.6	1.3
CORONADO TRAIL SNOTEL	8400	3/31	--	0.0	5.1	---
Forest Dale	6430	3/30	0	0.0	0.1	0.2
Ft. Apache	9160	3/30	24	6.2	13.6	6.3
Hannagan Meadows	9090	3/30	24	7.0	23.2	8.4**
HANNAGAN MEADOWS SNOTEL	8960	3/31	--	9.9	21.1	---
Hawley Lake	8250	3/30	19	5.5	19.6	4.4**
HAWLEY LAKE SNOTEL	8250	3/31	--	4.7	21.7	---
Heber	7640	3/30	T	0.2	10.9	2.3
HEBER SNOTEL	7640	3/31	--	0.0	16.6	---
Maverick Fork	9050	3/30	17	6.3	19.8	7.6
MAVERICK FORK SNOTEL	9200	3/31	--	5.5	19.8	---
McNary	7225	3/30	1	0.4	2.1	1.1
MCNARY SNOTEL	7225	3/31	0	0.0	0.6	---
Milk Ranch	7000	3/30	0	0.0	0.1	0.7
Mt. Ord (A) ***	11000	3/23	74	21.8	---	26.7**
Nutrioso *	8500	3/30	0	0.0	1.9	0.9
Promontory Butte	7900	3/31	24	8.4	35.4	10.7**
PROMONTORY BUTTE SNOTEL	7900	3/31	--	11.0	---	---
Smith Cienega (A) ***	9850	3/25	54	15.3	---	20.9**
Sunrise Summit	10600	3/31	49	11.5	27.4	15.8**
Wilson Lake	9000	3/30	9	7.3	20.1	8.9**
Workman Creek	6900	3/31	0	0.0E	4.6	3.2
WORKMAN CREEK SNOTEL	6900	3/31	--	0.0	2.6	---
<u>LOWER COLORADO RIVER</u>						
Bill Williams Intermediate	8550	3/31	18	4.8	---	8.6**
Bill Williams Summit	8950	3/31	33	9.6	---	11.6**
Chalender *	7100	3/31	0	0.0	6.9	1.6
Fort Valley	7350	L A T E	R E P O R T		4.1	1.3
Grand Canyon	7500	L A T E	R E P O R T		0.3	1.1
Williams Ski Run	7720	3/31	22	6.3	22.5	7.8**

+ 1963-77 15-year period. (*) Adjacent drainage. (**) 1963-77 Adjusted Average. (A) Aerial observation: water content estimated. (***) Ground survey. E = Estimate.

SNOW ABOUT APRIL 1, 1981

DRAINAGE BASIN and/or SNOW COURSE		Date of Survey	THIS YEAR		PAST RECORD	
			Snow Depth (inches)	Water Content (inches)	Last Year	Average +
GILA RIVER						
Bear Wallow	8100	3/31	4	1.6	0.4	2.8
Beaver Head	8000	3/30	1	0.4	3.5	1.6
Coronado Trail	8400	3/30	0	0.0	6.6	1.3
CORONADO TRAIL SNOTEL	8400	3/31	--	0.0	5.1	---
Emory Pass #1*	7800	3/30	0	0.0	0.0	0.1**
Emory Pass #2*	7800	3/30	0	0.0	0.0	0.3**
Frisco Divide	8000	3/30	1	0.4	1.6	0.9
FRISCO DIVIDE SNOTEL	8000	3/31	0	0.0	0.0	---
Hannagan Meadows *	9090	3/30	24	7.0	23.2	8.4**
HANNAGAN MEADOWS SNOTEL	8960	3/31	--	9.9	21.1	---
Hummingbird (A)	10550	3/31	21	6.7	25.2	15.7**
LOOKOUT MOUNTAIN SNOTEL	8150	--	--	---	0.9	---
McKnight Cabin * (A) ***	9300	3/24	3	0.8	3.9	3.2**
Mogollon	7000	3/31	0	0.0	0.0E	0.1
Nutrioso	8500	3/30	0	0.0	1.9	0.9
Redstone Trail	8600	3/31	14	4.7	9.5E	6.5
Rose Canyon	7300	3/30	0	0.0	0.0	0.6
SIGNAL PEAK SNOTEL	8360	3/31	0	0.0	---	---
Silver Creek Divide	9070	3/31	23	7.5	16.0E	10.4**
SILVER CREEK DIVIDE SNOTEL	9070	3/31	--	7.1	15.8	---
State Line	8000	3/30	0	0.0	1.8	1.1
Whitewater (A)	10750	3/31	66	19.8	40.0	20.6**
VERDE RIVER						
Baker Butte	7330	3/30	2	0.7	14.4	4.2**
BAKER BUTTE SNOTEL	7330	3/31	--	2.1	18.9	---
Baker Butte #2	7700	3/30	22	7.5	28.6	10.2**
Camp Wood	5700	3/30	0	0.0	---	0.1
Chalender *	7100	3/31	0	0.0	6.9	1.6
Copper Basin Divide	6720	3/30	0	0.0	0.0	0.8
Fort Valley	7350	L A T E R E P O R T			4.1	1.3
FRY SNOTEL	7200	3/31	--	0.0	14.9	---
Gaddes Canyon	7600	3/30	17	4.7	13.7	4.7
Happy Jack	7630	3/30	6	1.4	9.7	2.3
Iron Springs *	6200	3/30	0	0.0	0.0	0.2
Mingus Mountain	7100	3/30	1	0.3	0.0	0.5
Mormon Lake *	7350	3/30	2	0.5	8.9	2.7
Mormon Mountain	7500	3/30	5	1.6	15.5	4.3
MORMON MOUNTAIN SNOTEL	7500	3/31	--	3.0	19.1	---
Mormon Mtn. Summit #2	8470	3/31	28	9.6	---	---
Newman Park	6750	3/30	0	0.0	1.0	1.3
Snow Bowl #1	10260	3/30	34	8.0	26.2	10.8
Snow Bowl #2	11000	3/30	59	13.5	37.6	18.6**
SUGAR LOAF SNOTEL	6120	3/31	--	0.0	0.0	---
White Horse Lake Jct.	7180	3/31	0	0.0	8.1	2.1**
WHITE HORSE LAKE JCT. SNOTEL	7180	3/31	--	0.0	13.1	---
White Spar	6000	3/30	0	0.0	0.0	0.2

+ 1963-77 15-year period. (*) Adjacent drainage. (**) 1963-77 Adjusted Average. (A) Aerial observation: water content estimated. E = Estimate. (***) Ground survey

SNOW ABOUT APRIL 1, 1981

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	Last Year
<u>LITTLE COLORADO RIVER</u>						
Baldy	9220	3/30	18	5.5	14.8	6.0
BALDY SNOTEL	9220	3/31	--	7.5	12.8	---
Canyon Creek	7500	3/30	0	0.0	9.6	2.2
Canyon Point	7600	3/30	0	0.0	11.7	2.3**
Cheese Springs	8600	3/31	15	4.3	9.3	5.3**
Forest Dale	6430	3/30	0	0.0	0.1	0.2
Ft. Apache	9160	3/30	24	6.2	13.6	6.3
Fort Valley	7350	L A T E R E P O R T			4.1	1.3
Happy Jack	7630	3/30	6	1.4	9.7	2.3
Heber	7640	3/30	T	0.2	10.9	2.3
HEBER SNOTEL	7640	3/31	--	0.0	16.6	---
Lake Mary	6970	3/30	0	0.0	0.4	---
McNary	7225	3/30	1	0.4	2.1	1.1
MCNARY SNOTEL	7225	3/31	--	0.0	0.6	---
Mormon Lake	7350	3/30	2	0.5	8.9	2.7
Mormon Mountain	7500	3/30	5	1.6	15.5	4.3
MORMON MOUNTAIN SNOTEL	7500	3/31	--	3.0	19.1	---
Nutrioso *	8500	3/30	0	0.0	1.9	0.9
Mormon Mtn. Summit #2	8470	3/31	28	9.6	---	---
Promontory Butte	7900	3/31	24	8.4	35.4	10.7**
PROMONTORY BUTTE SNOTEL	7900	3/31	--	11.0	---	---
Snow Bowl #1	10260	3/30	34	8.0	26.2	10.8
Snow Bowl #2	11000	3/30	59	13.5	37.6	18.6**
Wilson Lake	9000	3/30	9	7.3	20.1	8.9**

[†] 1963-77 15-year period. (*) Adjacent drainage. (**) 1963-77 Adjusted average. (A) Aerial observation: water content estimated. E = estimate.

SNOW ABOUT MARCH 15, 1981

DRAINAGE BASIN and/or SNOW COURSE		Date of Survey	THIS YEAR		PAST RECORD	
			Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	Last Year
<u>SALT RIVER</u>						
Baldy *	9220	3-11	27	4.6	14.5	7.3
BALDY SNOTEL	9220	3-15	--	7.7	13.8	---
Beaver Head	8000	3-13	14	3.0	5.3	2.4
BONITO ROCK SNOTEL	8270	---	--	---	---	---
Canyon Creek	7500	3-12	8	2.1	10.4	3.5
Canyon Point	7600	3-12	11	2.5	12.9	3.9**
Coronado Trail	8400	3-13	14	3.1	9.6	2.4
CORONADO TRAIL SNOTEL	8400	3-15	--	3.3	9.2	---
Forest Dale	6430	3-13	0	0.0	0.0	0.5
Ft. Apache	9160	3-11	30	7.2	13.7	7.8
Hannagan Meadows	9090	3-13	29	6.0	22.6	9.0**
HANNAGAN MEADOWS SNOTEL	8960	3-15	--	10.9	19.5	---
Hawley Lake	8250	3-13	27	6.4	20.6	6.7**
HAWLEY LAKE SNOTEL	8250	3-15	--	5.5	19.1	---
Heber	7640	3-12	9	2.2	11.9	3.8
HEBER SNOTEL	7640	3-15	--	3.1	16.7	---
Maverick Fork	9050	3-15	--	3.5E	18.9E	9.1
MAVERICK FORK SNOTEL	9200	3-15	--	6.3	18.9	---
McNary	7225	3-13	14	3.3	3.3	2.0
MCNARY SNOTEL	7225	3-15	--	2.3	2.1	---
Milk Ranch	7000	3-13	10	2.0	0.0	0.8
Mt. Ord (A)	11000	N O T	S C H E D U L E	D---	---	---
Nutrioso *	8500	3-13	12	2.7	2.9	1.5
Promontory Butte	7900	3-13	28	8.2	34.1	12.7**
PROMONTORY BUTTE SNOTEL	7900	3-15	--	7.4	---	---
Smith Cienega (A)	9850	N O T	S C H E D U L E	D---	---	---
Sunrise Summit	10600	3-12	48	10.8	26.8	14.6**
Wilson Lake	9000	3-13	43	8.1	19.4	10.5**
Workman Creek	6900	3-17	7	2.5	7.3	5.4
WORKMAN CREEK SNOTEL	6900	3-15	--	2.1	5.8	---
<u>LOWER COLORADO RIVER</u>						
Bill Williams Intermediate	8550	3-13	20	3.5	---	8.9**
Bill Williams Summit	8950	3-13	31	6.6	---	11.5**
Chalender *	7100	N O R E P O R T			8.0	2.6
Fort Valley	7350	3-13	2	0.6	7.0	2.0
Grand Canyon	7500	3-13	3	0.8	0.6	1.4
Williams Ski Run	7720	3-13	22	4.8	23.2	8.0**

+ 1963-77 15-year period. (*) Adjacent drainage. (**) 1963-77 Adjusted Average. (A) Aerial observation: water content estimated. E = estimate.

SNOW ABOUT MARCH 15, 1981

DRAINAGE BASIN and/or SNOW COURSE		Date of Survey	THIS YEAR		PAST RECORD	
NAME	Elevation		Snow Depth (Inches)	Water Content (Inches)	Last Year	Average ⁺
GILA RIVER						
Bear Wallow	8100	3-14	11	4.5	0.8	4.2
Beaver Head	8000	3-13	14	3.0	5.3	2.4
Coronado Trail	8400	3-13	14	3.1	9.6	2.4
CORONADO TRAIL SNOTEL	8400	3-15	--	3.3	9.2	---
Emory Pass #1 *	7800	3-12	T	0.1	0.0	0.5**
Emory Pass #2 *	7800	3-12	1	0.3	0.0	1.1**
Frisco Divide	8000	3-13	8	1.7	3.7	1.9
FRISCO DIVIDE SNOTEL	8000	3-15	--	2.1	2.5	---
Hannagan Meadows *	9090	3-13	29	6.0	22.6	9.0**
HANNAGAN MEADOWS SNOTEL	8960	3-15	--	10.9	19.5	---
Hummingbird (A)	10550	N O T	S C H E D U L E	D	---	16.3**
LOOKOUT MOUNTAIN SNOTEL	8150	---	--	--	0.5	---
McKnight Cabin * (A)	9300	N O T	S C H E D U L E	D	---	3.5**
Mogollon	7000	N O T	S C H E D U L E	D	0.0E	0.4
Nutrioso	8500	3-13	12	2.7	2.9	1.5
Redstone Trail	8600	N O T	S C H E D U L E	D	9.0E	7.1
Rose Canyon	7300	3-14	3	0.9	0.0	1.9
SIGNAL PEAK SNOTEL	8360	---	--	--	--	---
Silver Creek Divide	9070	3-15	--	7.0E	15.7E	10.8**
SILVER CREEK DIVIDE SNOTEL	9070	3-15	--	7.0	15.8	---
State Line	8000	3-13	9	2.4	6.0	1.9
Whitewater (A)	10750	N O T	S C H E D U L E	D	---	19.7**
VERDE RIVER						
Baker Butte	7330	3-12	12	3.6	14.4	6.0**
BAKER BUTTE SNOTEL	7330	3-15	--	3.6	16.7	---
Baker Butte #2	7700	3-12	27	7.4	27.1	12.1**
Camp Wood	5700	3-13	0	0.0	0.0	0.4
Chalender *	7100	N O	R E P O R T		8.0	2.6
Copper Basin Divide	6720	3-13	7	2.0	0.0	1.6
Fort Valley	7350	3-13	2	0.6	7.0	2.0
FRY SNOTEL	7200	3-15	--	2.1	12.8	---
Gaddes Canyon	7600	3-13	16	4.2	12.1	5.6
Happy Jack	7630	3-13	9	2.7	12.4	3.4
Iron Springs *	6200	3-13	0	0.0	0.0	0.4
Mingus Mountain	7100	3-13	2	0.3	0.0	0.9
Mormon Lake *	7350	3-12	6	2.0	11.5	4.2
Mormon Mountain	7500	3-12	8	2.4	16.6	5.8
MORMON MOUNTAIN SNOTEL	7500	3-15	--	3.6	18.2	---
Mormon Mtn. Summit #2	8470	N O	R E P O R T		---	---
Newman Park	6750	3-12	2	0.4	4.0	1.9
Snow Bowl #1	10260	3-13	24	4.8	24.0	10.2
Snow Bowl #2	11000	3-13	48	9.5	36.7	17.0**
SUGAR LOAF SNOTEL	6120	3-15	--	0.0	0.0	---
White Horse Lake Jct.	7180	3-13	8	1.4	10.0	3.2**
WHITE HORSE LAKE JCT. SNOTEL	7180	3-15	--	3.3	14.4	---
White Spar	6000	3-13	0	0.0	0.0	0.5

⁺ 1963-77 15-year period. (*) Adjacent drainage. (**) 1963-77 Adjusted Average. (A) Aerial observation: water content estimated. E= estimated.

SNOW ABOUT MARCH 15, 1981

DRAINAGE BASIN and or SNOW COURSE		THIS YEAR			PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	Last Year
<u>LITTLE COLORADO RIVER</u>						
Baldy	9220	3-11	27	4.6	14.5	7.3
BALDY SNOTEL	9220	3-15	--	7.4	13.8	---
Canyon Creek	7500	3-12	8	2.1	10.4	3.5
Canyon Point	7600	3-12	11	2.5	12.9	3.9**
Cheese Springs	8600	3-13	23	5.4	10.4	6.9**
Forest Dale	6430	3-13	0	0.0	0.0	0.5
Ft. Apache	9160	3-11	30	7.2	13.7	7.8
Fort Valley	7350	3-13	2	0.6	7.0	2.0
Happy Jack	7630	3-13	9	2.7	12.4	3.4
Heber	7640	3-12	9	2.2	11.9	3.8
HEBER SNOTEL	7640	3-15	--	3.1	16.7	---
Lake Mary	6970	3-12	T	0.0	1.0	---
McNary	7225	3-13	14	3.3	3.3	2.0
MCNARY SNOTEL	7225	3-15	--	2.3	2.1	---
Mormon Lake	7350	3-12	6	2.0	11.5	4.2
Mormon Mountain	7500	3-12	8	2.4	16.6	5.8
MORMON MOUNTAIN SNOTEL	7500	3-15	--	3.6	18.2	---
Mormon Mtn. Summit #2	8470	N O R E P O R T			---	---
Nutrioso *	8500	3-13	12	2.7	2.9	1.5
Promontory Butte	7900	3-13	28	8.2	34.1	12.7**
PROMONTORY BUTTE SNOTEL	7900	3-15	--	7.4	---	---
Snow Bowl #1	10260	3-13	24	4.8	24.0	10.2
Snow Bowl #2	11000	3-13	48	9.5	36.7	17.0**
Wilson Lake	9000	3-13	43	8.1	19.4	10.5**

+ 1963-77 15-year period. (*) Adjacent drainage. (**) 1963-77 Adjusted Average. (A) Aerial observation: water content estimated

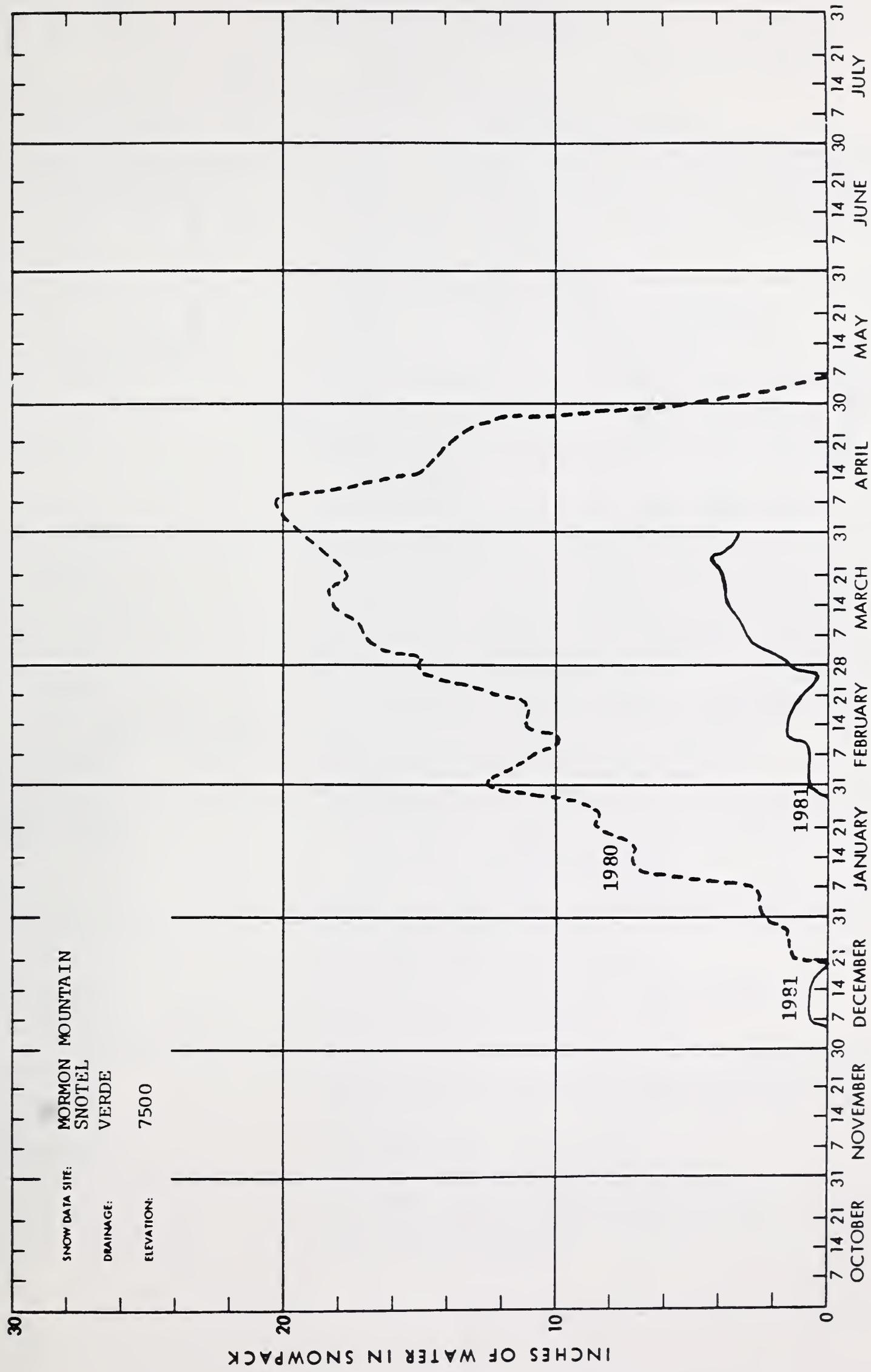
PRECIPITATION (inches) ABOUT APRIL 1, 1981

DRAINAGE BASIN and PRECIPITATION GAGE LOCATION	ELEVATION	CURRENT INFORMATION			FROM APPROX. NOV. 1 TO DATE		
		Date of Reading	Month's Precipitation	Average [†]	This Year	Average [†]	Percent of Average
GILA RIVER							
Silver Creek Divide	9000	3/31	5.00	2.84*	9.45	13.35	71
Hannagan Meadows **	9030	3/30	6.10	2.31	12.63	11.90	106
Frisco Divide **	8000	3/30	3.47	1.32	5.25	5.85	90
SALT RIVER							
Canyon Point	7600	3/30	6.35	3.82*	11.50	16.45	70
Hannagan Meadows **	9030	3/30	6.10	2.31	12.63	11.90	106
Little Wildcat (Heber Snow Course)	7600	3/30	5.43	3.20	9.92	14.38	69
Maverick Fork	9050	3/31	5.60	2.57	9.16	12.47	73
Workman Creek **	6970	---	---	3.50	---	16.69	---
Wilson Lake	9100	3/30	7.25	3.18*	11.16	12.14	92
VERDE RIVER							
Baker Butte	7300	3/30	6.29	3.45*	11.53	15.82	73
Copper Basin Divide	6720	3/30	5.51	3.01	8.93	11.90	75
Fort Valley **	7350	NO REPORT		2.20	---	8.86	---
Happy Jack **	7480	3/30	4.45	2.66	8.46	12.02	70
Mingus Mountain	7660	3/30	3.00	2.46	6.47	9.71	67
Mormon Mountain	7500	3/30	6.50	3.94	9.34	17.14	54
White Horse Lake Jct.**	7150	3/31	5.75	3.37	11.51	14.58	79
LITTLE COLORADO							
Greer Lakes	8500	3/30	3.80	1.41	5.66	6.40	88
Little Wildcat (Heber Snow Course)	7600	3/30	5.43	3.20	9.92	14.38	69
Sheep Crossing (Baldy Snow Course)	9125	3/30	7.30	2.61	10.54	11.48	92

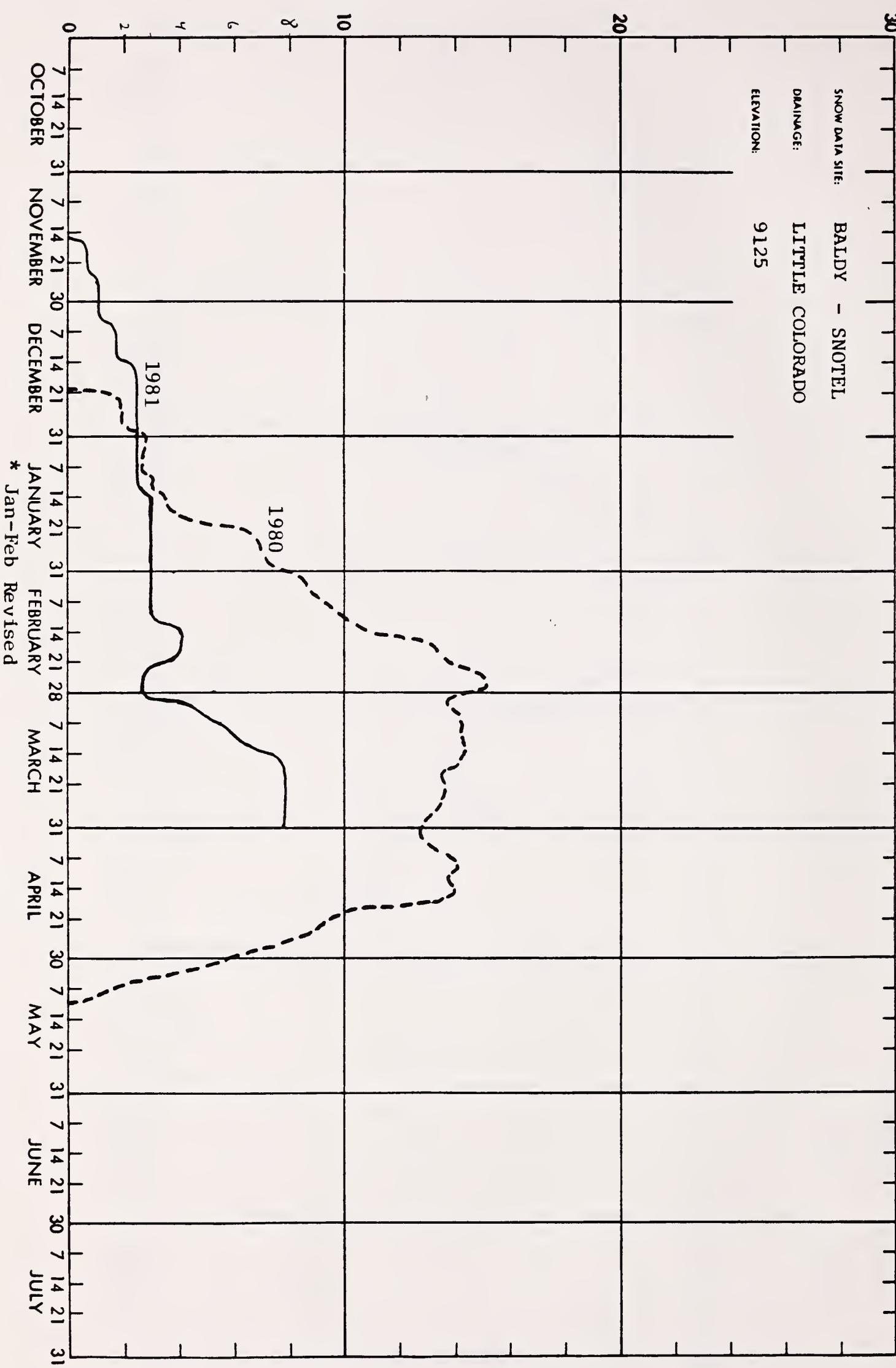
[†] 1963-77 Average^{*} Adjusted Average^{**} Data Supplied by U.S. Forest Service

PRECIPITATION (Inches) ABOUT APRIL 1, 1981 (SNOTEL SITES)

DRAINAGE BASIN and PRECIPITATION GAGE LOCATION	ELEVATION	CURRENT INFORMATION			FROM APPROX NOV 1 TO DATE		
		Date of Reading	Month's Precipitation	Average +	This Year	Average +	Percent of Average
<u>GILA RIVER</u>							
Coronado Trail	8400	3/31	4.3	---	6.4	---	---
Hannagan Meadows	8960	3/31	5.8	---	11.5	---	---
Frisco Divide	8000	3/31	3.1	---	5.4	---	---
Silver Creek Divide	9000	3/31	5.8	---	9.7	---	---
Lookout Mountain	8150	3/31	---	---	---	---	---
Signal Peak	8360	3/31	2.5	---	5.7	---	---
<u>SALT RIVER</u>							
Promontory Butte	7930	3/31	7.6	---	13.2	---	---
Heber	7640	3/31	5.5	---	11.3	---	---
Hawley Lake	8250	3/31	8.3	---	13.6	---	---
McNary	7200	3/31	6.0	---	11.2	---	---
Bonito Rock	8270	3/31	8.2	---	14.0	---	---
Hannagan Meadows	8960	3/31	5.8	---	11.5	---	---
Maverick Fork	9050	3/31	5.6	---	10.2	---	---
Coronado Trail	8400	3/31	4.3	---	6.4	---	---
Workman Creek	6900	3/31	---	---	---	---	---
<u>VERDE RIVER</u>							
White Horse Lake Jct.	7180	3/31	5.7	---	10.4	---	---
Fry	7200	3/31	5.3	---	9.2	---	---
Mormon Mountain	7500	3/31	5.5	---	9.9	---	---
Sugar Loaf	6120	3/31	4.0	---	6.9	---	---
Baker Butte	7300	3/31	8.2	---	12.5	---	---
<u>LITTLE COLORADO</u>							
Baldy	9125	3/31	6.8	---	10.7	---	---
McNary	7200	3/31	6.0	---	11.2	---	---
Heber	7640	3/31	5.5	---	11.3	---	---
Promontory Butte	7930	3/31	7.6	---	13.2	---	---



INCHES OF WATER IN SNOWPACK



SNOW COURSE

SNOW SURVEYORS DURING 1981

Agassiz	SCS (Jorgensen, Francisco)
Baker Butte #1 & #2	SCS (Harrelson and Jones)
Baldy #1	SCS (Caporaso, Castillo, Jodie, Kyle, Matthews, Thompson, and Wood)
Baldy #2 & #3	SCS (Jones and Thompson)
Bear Wallow	Coronado N.F. (Kennedy and Palmer)
Beaver Head	Apache-Sitgreaves N.F. (Bonomo, Dwyer, Lee and Vahle)
Bill Williams Intermediate	Kaibab N.F. (Garcia, Gillett, O'Leary, Price and Rollins)
Bill Williams Summit	Kaibab N.F. (Garcia, Gillett, O'Leary, and Rollins)
Bright Angel	National Park Service (D. Allison and R. Allison)
Camp Wood	Prescott N.F. (Ewlberg)
Canyon Creek	SCS (Harrelson and Jones)
Canyon Point	SCS (Harrelson and Jones)
Chalender	Kaibab N.F. (Case, Kramer, and Powell)
Cheese Springs	SCS (Castillo, Kyle, Thompson, and Wood)
Copper Basin Divide	SCS (Jalving, Smith and Wilkerson)
Coronado Trail	Apache-Sitgreaves N.F. (Bonomo, Dwyer, Lee and Vahle)
Emory Pass #1 & #2	SCS (Bray and Garcia)
Forest Dale	Bureau of Indian Affairs (Endfield, Grippen and King)
Ft. Apache	SCS (Caporaso, Castillo, Jodie, Kyle, Matthews, Thompson, and Wood)
Ft. Valley	Rocky Mountain Forest and Range Experimental Station
Frisco Divide	Gila N.F. (Gibbons and McDonald)
Gaddes Canyon	SCS (Paul Lidbeck - Contract)
Grand Canyon	National Park Service (Faust, Miller and Stephan)
Hannagan Meadows	Apache-Sitgreaves N.F. (Bonomo, Dwyer, Lee, and Vahle)
Happy Jack	Coconino N.F. (Allred and Polequira)
Hawley Lake	Bureau of Indian Affairs (Endfield, Grippen and King)
Heber	SCS (Harrelson and Jones)
Hummingbird	SCS (Alexander, Heller, Knoche, and Thompson)
Inner Basin #1 (Bear Paw)	SCS (Francisco, Jorgensen and Talbot)
Inner Basin #2 (Snowslide)	SCS (Francisco, Jorgensen and Talbot)
Iron Springs	SCS (Jalving, Smith and Wilkerson)
Lake Mary	SCS (Francisco and Peters)
Maverick Fork	SCS (Caporaso, Castillo, Thompson and Wood)
McKnight Cabin	SCS (Alexander, Heller, Knoche, and Thompson - Contractors; and Bray and Garcia - SCS)
McNary	Bureau of Indian Affairs (Endfield, Grippen and King)
Milk Ranch	Bureau of Indian Affairs (Endfield, Grippen and King)
Mingus Mountain	SCS (Paul Lidbeck - Contract)
Mogollon	SCS (James Lyon - Contract)
Mormon Lake	SCS (Francisco, Jorgensen, King and Peters)
Mormon Mountain	SCS (Francisco, Jorgensen, King and Peters)
Mormon Mountain Summit	SCS (Jorgensen and King)
Mt. Ord	Salt River Project (Warskow), SCS (Jones and Thompson)
Newman Park	SCS (Francisco, Jorgensen, King and Peters)
Nutrioso	Apache-Sitgreaves N.F. (Bonomo, Dwyer, Lee and Vahle)
Promontory Butte	SCS (Jones)
Redstone Trail	SCS (James Lyon - Contract)
Rose Canyon	Coronado N.F. (Kennedy and Palmer)
Silver Creek Divide	SCS (James Lyon - Contract)
Smith Cienega	Salt River Project (Warskow), SCS (Jones and Thompson)
Snow Bowl #1 and #2	Coconino N.F. (Hughes)

SNOW COURSE**SNOW SURVEYORS DURING 1981**

State Line	Gila N.F. (Gibbons and McDonald)
Sunrise Summit	SCS (Harvey, Kyle, Thompson and Wood)
White Horse Lake Jct.	Kaibab N.F. (Garcia, Gillett, O'Leary and Rollins)
White Spar	SCS (Jalving, Smith and Wilkerson)
Whitewater	SCS (Alexander, Heller, Knoche, and Thompson)
Williams Ski Run	Kaibab N.F. (Garcia, Gillett, O'Leary and Rollins)
Wilson Lake	SCS (Caporaso, Castillo, Jodie, Matthews, Thompson and Wood)
Workman Creek	Rocky Mountain Forest and Range Experimental Station

14

13

12

11

10

9

8

7

N E V A D A

Lower Colorado

Upper
Colorado

COLC

N

P

F

70

T

U

LEGEND

	State Boundary
	County Boundary
	State Capital
	County Seat (small town)
	Town Less than 5,000 Population
	Town 5,000 to 25,000 Population
	Town Over 25,000 Population
	of the 1,600,000 people in the state

Towns of less than 5,000 omitted from map unless incorporated or required for orientation purposes.

Legend for stream network symbols and boundary types:

- Stream Symbols:**
 - Blue line with dots: Major Stream
 - Blue line with dashes: Minor Stream
 - Blue line with a triangle: Channel
 - Blue line with a circle: Canal or Ditch
 - Blue line with a wavy line: Large Stream
 - Blue line with a small circle: Small Stream
 - Blue line with a cross: Water Spreading
 - Blue line with a point: Forecast Point
- Boundary Symbols:**
 - Red line with dots: Watershed Boundary
 - Red line with dashes: Sub-watershed Boundary
 - Red line with a dot and a lightning bolt: Snow Data Monitoring Site
 - Red line with a dot and a radio tower: Radio Telemetry



SNOW COURSES AND RELATED DATA MEASURING SITES

ARIZON

1987

0 20 40 MILE
SCALE 1:3,660,000
GILBERT EQUAL AREA PROJECTION

USGS National Atlas 1:1,000,000 Albers
Equal-Area projection (1967) used as source
for base map and adapted for SCS use.

INDEX TO SNOW COURSES

NUMBER	NAME	SEC.	TWP.	RGE.	ELEV.	DRAINAGE	OBSERVER	RECORD BEGAN
11P10A	Agassiz	32	23N	7E	11200	Little Colorado	SCS-CF*	1968
11R6PSPRT	Baker Butte	4	12N	9E	7300	Verde	SCS	1966
11R7	Baker Butte #2	9	12N	9E	7700	Verde	SCS	1971
9S1APSPRT	Baldy	28	7N	27E	9125	Little Colorado	SCS	1950
9S15	Baldy #2	12	6N	26E	9750	Little Colorado	SCS	1963
9S16	Baldy #3	13	6N	26E	10950	Little Colorado	SCS	1963
10T1	Bear Wallow	6	12S	16E	8100	Gila	FS	1948
9S6	Beaver Head	13	4N	30E	8000	San Francisco	FS	1938
12P5	Bill William Intermediate	17	21N	2E	8550	Cataract	FS	1967
12P4	Bill Williams Summit	17	21N	2E	8950	Verde	FS	1967
9S18PSPRT	Bonito Rock		5N	26E	8270	Salt	SCS	1979
12N1	Bright Angel	34	33N	3E	8400	Bright Angel Creek	NPS	1947
12R1	Camp Wood	3	16N	6W	5700	Verde	FS	1946
10R7	Canyon Creek #2	18	11N	15E	7500	Little Colorado	SCS	1958
10R9P	Canyon Point	28	11N	14E	7600	Salt	SCS	1967
12P1	Chalender	27	22N	3E	7100	Verde	FS	1947
9R7	Cheese Springs	28	8N	27E	8600	Little Colorado	SCS	1969
12R6P	Copper Basin Divide	23	13N	3W	6720	Verde	SCS	1963
9S7PSPRT	Coronado Trail	26	5N	30E	8000	San Francisco	FS	1938
7T1	Emory Pass #1	16	16S	9W**	7800	Mimbres	SCS	1967
7T2	Emory Pass #2	16	16S	9W**	7800	Mimbres	SCS	1967
11P13PSPRT	Fry	35	20N	5E	7220	Verde	SCS	1978
10R6	Forest Dale	2	9N	21E	6430	Salt	BIA	1939
9R5	Ft. Apache	18	7N	27E	9160	Little Colorado	SCS	1951
11P2P	Ft. Valley	22	22N	6E	7350	Little Colorado	FS	1947
8S1PSPRT	Frisco Divide	31	6S	20W**	8000	San Francisco	FS	1938
12R4	Gaddes Canyon	11	15N	2E	7600	Verde	SCS	1954
11P1	Grand Canyon	21	30N	4E	7500	Hance Creek	NPS	1947
9S11PSPRT	Hannagan Meadows	19	3N	29E	9090	San Francisco	FS	1964
11R5P	Happy Jack	30	16N	9E	7630	Verde	FS	1951
9R10PSPRT	Hawley Lake	13	7N	24E	8300	Salt	BIA	1966
10R4PSPRT	Heber	28	11N	15E	7600	Little Colorado	SCS	1950
8S9A	Hummingbird	19	11S	17W**	10550	Gila	SCS	1964
11P9P	Inner Basin #1	28	23N	7E	10000	Little Colorado	SCS-CF*	1967
11P8P	Inner Basin #2	28	23N	7E	9750	Little Colorado	SCS	1967
12R2	Iron Springs	22	14N	3W	6200	Little Colorado	SCS	1946
11P12	Lake Mary	21	19N	9E	6930	Little Colorado	SCS	1975
7S3PSPRT	Lookout Mountain	1	10S	10W	8500	Gila	SCS	1978
9S2APSPRT	Maverick Fork	13	6N	27E	9150	Salt	SCS	1950
7T3A	McKnight Cabin	10	15S	10W**	9300	Mimbres	SCS	1967
9R2PSPRT	McNary	23	8N	23E	7200	Salt	BIA	1939
9R1	Milk Ranch	33	8N	23E	7000	Salt	BIA	1941
12R3	Mingus Mountain	3	15N	2E	7100	Verde	SCS	1947
8S2	Mogollon	2	11S	19W**	7000	San Francisco	SCS	1953
11R4	Mormon Lake	13	18N	8E	7350	Little Colorado	SCS	1947
11R3APSPRT	Mormon Mountain	14	18N	8E	7500	Verde	SCS	1950
11R11	Mormon Mountain Summit #2	2	18N	8E	8470	Little Colorado	SCS	1975
9S12A	Mt. Ord	4	6N	26E	11200	Salt	SRP-SCS	1966
11P5	Newman Park	25	19N	6E	6750	Verde	SCS	1963
9S4	Nutrioso	23	6N	30E	8500	San Francisco	FS	1938
11R10PSPRT	Promontory Butte	5	11N	13E	7930	Little Colorado	SCS	1973
8S7	Redstone Trail	5	11S	18W**	8600	San Francisco	SCS	1961
10T2	Rose Canyon	15	12S	16E	7300	Gila	FS	1948
8T1PSPRT	Signal Peak	13	16S	13W	8360	Gila	SCS	1977
8S8PSPRT	Silver Creek Divide	4	11S	18W**	9000	San Francisco	SCS	1964
9S14A	Smith Cienega	10	6N	26E	10050	Salt	SRP-SCS	1966
11P4	Snow Bowl #1	36	23N	6E	10260	Verde	FS	1961
11P6	Snow Bowl #2	31	23N	7E	11000	Verde	FS	1965
9S8	State Line	6	6S	21W**	8000	San Francisco	FS	1938
9S17	Sunrise Summit	36	7N	26E	10600	Salt	SCS	1972
11R8PSPRT	Sugarloaf	8	8E	14N	6120	Verde	SCS	1978
12P2PSPRT	White Horse Lake Jct.	2	20N	2E	7180	Verde	FS	1967
12R5	White Spar	19	13N	2W	6000	Verde	SCS	1963
8S10A	Whitewater	19	11S	17W**	10750	Gila	SCS	1964
12P3	Williams Ski Run	9	21N	2E	7720	Cataract	FS	1967
9R6P	Wilson Lake	4	7N	26E	9000	Salt	SCS	1966
10S1PSPRT	Workman Creek	33	6N	14E	6900	Salt	FS	1952

A Aerial Snow Depth Marker

SP Snow Pressure Pillow

P Precipitation Storage Gage

T Temperature

R Radio Telemetry (SNOTEL)

** NM Principal Meridian

* City of Flagstaff

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IMPORTANT NOTICE

WATER SUPPLY OUTLOOK FOR ARIZONA

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